342.1 Dr.10

MEMORANDUM

RE: ARTIFICIAL CONTROL OF DENDROCTONUS VALENS BY THE USE OF CARBON DISULPHIDE AND ORTHODICHLOROBENZENE

H.J. RUST
COEUR D'ALENE, IDAHO

~~NOV. 8,~~ 1934
Aug. 17 1934

Forest Insect Laboratory
Coeur d'Alene, Idaho
Aug. 17, 1934

MEMORANDUM

Re: Artificial Control of Dendroctonus valens by the use of carbon disulphide and orthodichlorobenzene

The use of these two chemicals for artificial control of D. valens was tested out to ascertain their value as a quick and effective means of destroying the parent adults or broods of this bark beetle on trees of aesthetic value. As a large percent of the attacks by D. valens in this vicinity are confined to freshly cut Pinus ponderosa pine stumps, fire-scorched trees and those attacked by D. brevicomis or injured by mechanical means, this type of attacked material was found most useful for the experiment.

A total of 72 D. valens attacks were treated, 21 with orthodichlorobenzene and 51 with carbon disulphide. Sixty attacks were treated on freshly cut stumps ranging from 10 to 18 inches, and 12 in a 30-inch-d.b.h. ponderosa pine recently attacked by the western pine beetle. As the main idea of the experiment was to apply the chemicals with as little damage as possible to the bark or wood surfaces, care was used in an effort to open up the egg galleries sufficiently to permit access of the liquid and gas formed to the infested portion. After locating a new attack by the large pitch tube and boring dust, the bark was thinned down by the use of a large knife or hand axe, in a line above the entrance or pitch tube, until a small opening into the egg gallery was visible. The liquid chemical was injected into this opening between the bark and wood by the use of a small oil can with slightly curved spout. Where the egg galleries were constructed at or below the ground line the soil absorbed much of the chemical and helped confine the poisonous gasses. The following tables give the complete data secured from the experiment:

TABLE I. SHOWING RESULTS OF ARTIFICIAL CONTROL EXPERIMENT
ON D. VALENS BY THE USE OF ORTHODICHLOROBENZENE FULL STRENGTH

Date of treatment	Size of tree stump	Bark thickness	Attacks above or at ground	Chemical used	Amount of chemical	Development of D. valens attack	Date examined	Status of D.v. brood	Percent of kill	Check attacks
7/10/34	14"	1½"	3-ground	Orthodi.	2 oz. (fluid)	Egg gall. started	8/16/34	No brood	100%	Larvae ½ to 2/3
7/10/34	16"	1½"	12- "	"	"	Egg stage	"	3 atts.-brood	75%	"
7/12/34	12"	1"	6- "	"	"	" "	"	4 atts.-no brood 1 att.-brood	80%	"
Total			21- "					17 atts.-no brood 4 atts.-brood	80% kill 20% no kill	

The failure to secure a 100% kill in all the attacks was probably due to the irregular shape of four of the egg galleries, and to the amount of frass and drying pitch. In all the galleries where the penetration of the chemical was uninterrupted, a total kill was secured.

TABLE II. SHOWING RESULTS OF ARTIFICIAL CONTROL EXPERIMENT ON D. VALENS BY THE USE OF CARBON DISULPHIDE FULL STRENGTH

Date of treatment	Size of tree or stump	Bark thickness	Attacks above or at ground	Chemical used	Amount of chemical	Development of D.valens attack	Date examined	Status of D.v. brood	Percent of kill	Check attacks
7/12/34	10"	1"	3-ground	Carbon disulph.	1½ fluid oz. each attack	New attacks to egg stage	8/16/34	No brood. No P.A. alive	100%	Larvae ½ to 2/3
	12"	1⅛"	3-ground							
	12"	1½"	4-ground							
	12"	1½"	2-ground							
	12"	1⅝"	3-ground							
7/17/34	14"	1½"	3-ground						100%	
	10"	1"	1-ground							
	11"	1"	3-ground							
	18"	1½"	7-ground							
7/23/34	12"		4-ground						100%	
	14"		6-ground							
8/2/34	30" dbh: st.tree	3"	7-ground 5 above g				8/17/34	10 atts.-no brood: 2 atts.-live P.A.	83% kill 17% no kill	Eggs
Total			51 atts.					49 atts.-kill 2 " -no kill	96% kill 4% no kill	

Failure to secure a total of 100% kill on the standing tree was apparently due to the thickness of the bark, particularly in the undulations between the large roots at the ground level, and obstructions in the egg gallery, heavy frass packing, and drying pitch. After treating the new attacks, a careful check will show to a great extent if work has ceased by the discontinuance of pitch flow and boring dust. When this is still present after treatment, opening up a new portion of the gallery and an additional injection of chemical will undoubtedly give a complete kill. It is believed by the writer that carbon disulphide offers the best possibilities. The use of orthodichlorobenzene on 21 attacks gave an 80% kill. Carbon disulphide on 51 attacks gave a 96% kill.

Respectfully submitted

Henry J. Rust

Henry J. Rust
Senior Scientific Aid